

NEW TREE SPECIES FROM ESMERALDAS, ECUADOR
(CONCLUDED)

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A new species from the Province of Esmeraldas in northwestern Ecuador in the genus Chrysophyllum L. (Sapotaceae) is published here. Notes on several other tree species of that area are added.

This article is the fifth and last with the same title (Phytologia 18: 195-208, 404-418, 457-472, illus. 1969; 19: 251-269, illus. 1970). The work was done under the forestry project, Desarrollo Forestal de Noroccidente (DEFORNO), Dirección General de Bosques, Quito, Ecuador. This was United Nations Special Fund Project No. 127, administered by the Food and Agriculture Organization (FAO) of the United Nations and the Government of Ecuador.

The new species were described and illustrated also in a book on the common trees of Esmeraldas, volume 4 of the final report of the project. This book on the common trees of Esmeraldas by Elbert L. Little, Jr., and Robert G. Dixon, "Arboles Comunes de la Provincia de Esmeraldas," has been published by the Food and Agriculture Organization (FAO) of the United Nations as: Estudio de Preinversión para el Desarrollo Forestal del Noroccidente, Ecuador, Informe Final Tomo IV, Arboles Comunes de la Provincia de Esmeraldas, Roma, 1969 [1970], 535 pág., illus. (FAO/SF: 76/ECU 13). Requests for this publication should be addressed to: FAO Documentation Center, Via delle Terme di Caracalla - 00100, Rome, Italy.

"Arboles Comunes de la Provincia de Esmeraldas" contains descriptions in Spanish and drawings of 230 common tree species of Esmeraldas, including all 20 new species described in this series of articles based upon specimens collected in 1965-1966. Also, 11 more tree species in this book were in my collection in 1943 with the forest survey of the Latin American Forest Resources Project, of the Forest Service, United States Department of Agriculture, and were named in my earlier article (New species of trees from western Ecuador. Wash. Acad. Sci. Jour. 38: 87-105, illus. 1948). Three additional species in the book were named by others from type specimens collected by the 1943 survey: Sorocea sarcocarpa Lanjouw et M. Boer, Swartzia littlei R. S. Cowan, Dacryodes cupularis Cuatr. Thus, 34 or more species of this book were proposed as new. About 20 of the 230 species described and illustrated still have not been identified to species. Some specimens are incomplete and inadequate for determination, while others are also in difficult groups, 9 in Lauraceae, one of the largest tree families of the province.

A few additional less common tree species omitted from the book were named as new from specimens collected in Esmeraldas by the 1943 survey, including: Heisteria cyathiformis Little, Brownea puberula Little, Miconia littlei Wurdack, Dermatocalyx panduratus Moldenke. In 1943, sterile specimens of these odd, then unnamed species were collected in Esmeraldas: Hyeronima chocoensis Cuatr., Huberodendron patinoti Cuatr., Vochysia macrophylla Stafleu. Also fruiting specimens of Pereea rigens C. K. Allen, a species described from my Panama specimens collected earlier the same year. A few other species were unnamed when collected in 1943 but were described afterwards from Colombian specimens. Examples are Conostegia cuatrecasii Gleas. and Miconia centronioides Gleas. Also, Inga chocoensis Killip ex Elias, found in Esmeraldas in 1965, was named in 1967 from a Colombian specimen.

Thus, this accessible area of wet tropical (rain) forests bordering the Pacific Ocean in northwestern Ecuador yielded many tree species new to science. Most of these probably occur also in adjacent southwestern Colombia in Nariño, some northward to Chocó or even Panama. Additional novelties are to be expected in the adjacent lower slopes of the Andes, where my field work was limited.

Among the less common tree species omitted from the book were about 40 collected in Esmeraldas in 1943 and listed in my earlier report (A collection of tree specimens from western Ecuador. Caribbean Forester 9: 215-298. 1948). That forest survey of several provinces in western Ecuador obtained large collections of other species. The 1965-1966 collection contains a smaller number of less common species that were not mentioned in the book.

CHRYSOPHYLLUM COLLINUM Little, sp. nov. "Caimitillo." Fig. 24.

Arbor magna sempervirens ad 40 m. alta, trunco 45 cm diametro, anteridibus humilibus angustis, latice albo. Cortex griseus vel brunneus fere laevis vel subtiliter fissuratus, lenticellis multis parvis verrucosis; cortex interior roseo- vel rubrovittatus, insipidus vel leviter amarus, latice albo insipido. Ramuli crassi; gemmae nudae foliorum minorum plicatorum formatae. Ramuli, gemmae, folia juvenia atque nervi foliorum subtus puberuli cinnamomei. Folia alterna, petiolis 2-3 cm. longis, longitudinaliter sulcatis, flavido-viridibus. Laminae ellipticae, 10-25 cm. longae, 5-12 cm. latae, parum coriaceae, apice et basi acutae vel acuminatae, margine integrae, nervis lateralibus multis parallelis fere rectis et impressis, supra atrovirentes glabrae et parum nitidae, subtus pallido-virides subtiliter adpresso-puberulae nervis lateralibus prominentibus cinnamomeis.

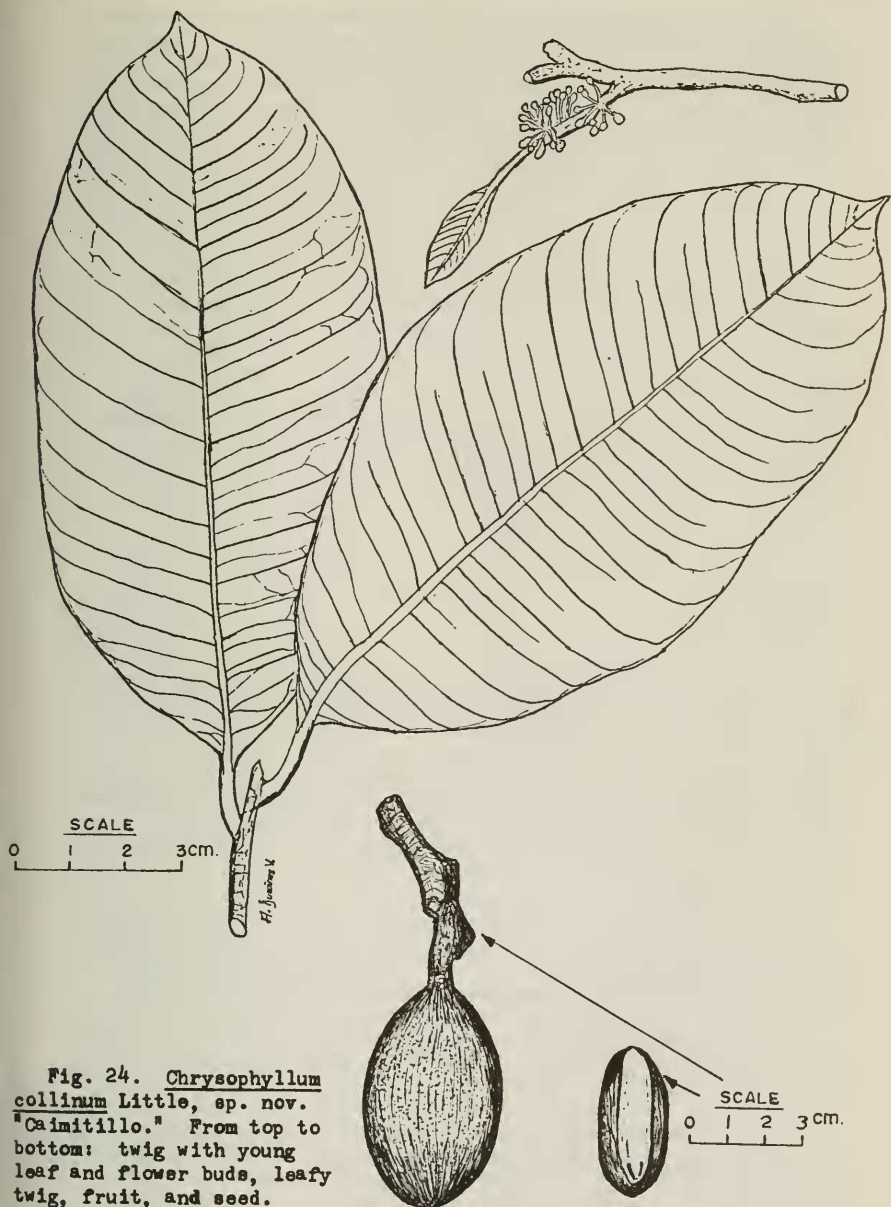


Fig. 24. *Chrysophyllum collinum* Little, sp. nov. "Caimitillo." From top to bottom: twig with young leaf and flower buds, leafy twig, fruit, and seed.

Flores pauci vel multi, ad nodos infra folia juvenia laterales pedicellis brevibus tenuibus puberulis 5-7 mm. longis. Alabastra rotundata, 2 mm. diametro, sepalis 5 imbricatis rotundatis puberulis fere 2 mm. longis; corolla tubularis glabra 5-lobata; stamina 5 ad tubum corollae alternatim lobulis inserta, antheris glabris; et pistilum ovario puberulo 5-loculare, ovulo 1 in quoque loculo, stylo brevi. Baccae ellipsoideae 6 cm. longae, 4 cm. diametro, pulpa aurantiacea tenui eduli saccharina. Semen 1 ellipsoideum 4.5 cm. longum, 2.5 cm. diametro, cicatrice longa lata.

Large evergreen tree to 30 m. high, with trunk 45 cm. in diameter, with low narrow buttresses. Bark gray or brown, smoothish or finely fissured, with many small warty lenticels; inner bark pink or reddish streaked, tasteless or slightly bitter, with white tasteless latex. Twigs stout; buds naked, formed from minute folded leaves. Twigs, buds, young leaves, and nerves of lower leaf surfaces appressed puberulent with cinnamon colored hairs. Leaves alternate, with petioles 2-3 cm. long, longitudinally grooved, yellow green. Blades elliptic, 10-25 cm. long, 5-12 cm. broad, slightly coriaceous, acute or acuminate at apex and base, with entire margin, with many parallel lateral nerves nearly straight and impressed, the upper surface dark green glabrous and slightly shiny, and the lower surface light green finely appressed puberulent, with prominent cinnamon brown lateral nerves.

Flowers few or many, lateral at nodes below young leaves with short slender puberulent pedicels 5-7 mm. long. Buds 2 mm. in diameter, with 5 overlapping rounded puberulent sepals nearly 2 mm. long, with tubular glabrous 5-lobed corolla, 5 stamens inserted on corolla tube opposite the lobes; and pistil with puberulent 5-celled ovary with 1 ovule in each locule and short style. Berry ellipsoidal, 6 cm. long, 4 cm. in diameter, orange, with thin edible sweetish pulp. Seed 1, ellipsoidal, 4.5 cm. long, 2.5 cm. in diameter, with long broad scar. Collected with flower buds and fruits in September.

ECUADOR, ESMERALDAS: Alto Tambo, alt. 650 m., lower montane forest, Sept. 23, 1965, E. L. Little, Jr., and R. G. Dixon 21124 (HOLOTYPE, US; isotype, NY); Sept. 22, 1965, E. L. Little, Jr., and R. G. Dixon 21116 (US, NY; wood sample, MADw).

Wood hard, with thin whitish sapwood and pink heartwood, with annual growth rings. Probable uses, construction, furniture, trim, and flooring.

A wood sample was taken from a tree from which herbarium specimens (21116) were obtained. Tests were made by the forest products laboratory at Universidad de Los Andes, Mérida, Venezuela. Physical characteristics of the wood were summarized in Spanish (page 474), as follows:

Specific gravity: 1.16 (green) and 0.97 (oven-dry). High modulus of elasticity. High resistance to compression parallel to the fibers, and low resistance perpendicular to the fibers. High modulus of rupture in compression parallel to the fibers. High hardness. Medium resistance to shearing. Very high toughness (tenacity). No difference in color between sapwood and heartwood. Natural color attractive. Straight grain. Crystals and resins present in wood.

The genus Chrysophyllum L. (family Sapotaceae) is tropical but largely American. The New World species, about 40, were monographed by Arthur Cronquist: *Studies in the Sapotaceae--I. The North American species of Chrysophyllum*. Torrey Bot. Club Bul. 72: 192-205. 1945; V. *The South American species of Chrysophyllum*. 73: 286-311. 1946.

Chrysophyllum collinum has mostly persistent cinnamon-colored pubescence and large orange ellipsoidal fruits. It was found in the foothills of the Andes at Alto Tambo and not in the coastal plain. A Spanish description and drawing of this new species were published as 194. *Caimitillo, Chrysophyllum* sp. by Little and Dixon (*Arboles Comunes de la Provincia de Esmeraldas* p. 472-474. 1969 [1970]). The drawing is repeated here (fig. 24).

The related species Chrysophyllum auratum Miq. (*Cynodendron auratum* (Miq.) Bæhni) is scattered in the wet tropical forest and tropophytic forest of the coastal plain of western Esmeraldas. It was collected by the forest survey at Atacames and Borbón (E. L. Little, Jr., and R. G. Dixon 21005, 21034) and at Río Pambil (C. Játiva and C. Epling 1086). In the forest survey of 1943, it was collected at Santo Domingo de los Colorados, Province of Pichincha, and at Playa de Oro, Province of Esmeraldas (E. L. Little, Jr. 6144, 6408). A Spanish description and drawing were published as 193. *Manzano, Chrysophyllum auratum* Miq. (p. 470-471). That species has rufous pubescence that turns pale in age and smaller purplish ellipsoidal or rounded fruits, also mostly smaller leaves. A variation with corolla glabrous or nearly so has been named from the foothills near Bucay in western Ecuador as *C. auratum* var. glabriflorum Monachino (*Phytologia* 4: 38. 1952).

Matisia soegengii Cuatrecasas (*Phytologia* 20: 468, fig. 1. 1971) is represented by sterile specimens collected in 1943 and 1965. Under 151. *Sapotillo, Matisia* sp., this recently named distinctive species was described and illustrated by Little and Dixon (p. 362-363). This species was meant in the indirect reference to incomplete material of an unnamed species of Matisia (*Phytologia* 18: 202. 1969). Sterile specimens were collected first at Santo Domingo de los Colorados, Pichincha, by the forest survey in 1943 (E. L. Little, Jr. 6161, US) and again at Río Hoja Blanca with Río Hualpi, Esmeraldas, in 1965 (E. L. Little, Jr. 21077, US, NY). The very large rounded cordate

leaves 25-40 cm. long and broad, with stout petioles almost as long, serve for recognition. The first specimen had been filed under the related species M. stenopetala Standl. et Cuatr. of Loreto, Peru. Also, the drawing of the flower (p. 636) was made from a specimen of that species from Peru. This species was named from good flowering material collected by Wertit Soegeng (Sept. 6, 1961, s. n., US, holotype).

Clusia venusta Little (Phytologia 19: 262-267, figs. 20-22, 1970). "matapalo." A detailed description and drawings of this interesting species have been published recently by Bassett Maguire (Continuing studies in the Guttiferae. Phytologia 19: 501-507, illus. 1970).

Virola flexuosa A. C. Smith is the fourth species of this genus, common name "chalviande," to be recorded from Esmeraldas. The sterile specimen (E. L. Little, Jr., and R. G. Dixon 21147) was cited by Little and Dixon (p. 128-129) as Virola sp. and related to that species. The determination as that species has since been confirmed.

The collection contains two related species of Echweilera (Lecythidaceae), known as "guasca," "teteguasca," and "cacaco." These were described in Spanish and illustrated by Little and Dixon (p. 432-435). One was identified there as Echweilera pittieri R. Knuth, a species of Panama. The second was cited as Echweilera sp. nov. but after further study is referred doubtfully here to another species of Panama, also Costa Rica, E. calyculata Pittier (?). This species was found in the wet tropical forest along Rio Verde (E. L. Little, Jr., and R. G. Dixon 21192, 21195, 21201). The earlier specimen of the 1943 forest survey from Quinindé (E. L. Little, Jr. 6238) had been identified for the collector as apparently a new species.

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